energizing the ions to form a stream from the plasma in the plasma chamber straight toward the substrate in the deposition chamber so that carbon from the ions is deposited over the magnetic layer, wherein the ions are energized using capacitative coupling by applying a capacitative alternating potential between a coupling electrode adjacent a first end of the plasma chamber and an extraction electrode adjacent a second end of the plasma chamber, the first and second ends defining an axis therebetween, the extraction electrode having a smaller surface area than the coupling electrode so that the plasma is self-biasing relative to the extraction electrode, wherein the ions impact with an energy which promotes formation of sp3 carbon-carbon bonds, and wherein the impacting ions have a substantially uniform weight.

2. (As Filed) A method as claimed in claim 1, further comprising selectively energizing the stream with a predetermined impact energy.

3. (As Filed) A method as claimed in claim 1, wherein the stream impacting the substrate is primarily composed of ions having a uniform weight.

4. (As Filed) A method as claimed in claim 1, wherein the impact energy of the ions is substantially uniform.

Claims 5-7 have previously been cancelled.

8. (Previously Amended) A method for producing magnetic recording media, the method comprising:

forming a magnetic layer over a substrate;

ionizing a source material by interelectrode vaporization of the source material, the source material comprising a solid carbon cathode, wherein the carbon cathode is heated sufficiently to produce an arc that is distributed over the cathode so as to inhibit ejection of macroparticles while forming a plasma containing ions which comprise carbon; and

energizing the ions to form a stream from the cathode straight toward the substrate so that carbon from the ions is deposited over the magnetic layer, wherein the ions impact with an energy which promotes formation of sp3 carbon-carbon bonds.

Received Event (Event Succeeded)

Date: 7/8/98 Time: 1:20 PM
Pages: 8 Sender: 14153253201
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Company: JUL. 8.1998 10:24AM TTC @ ANNEX Type: Fax NO.225 P.5

9. (As Filed) A method as claimed in claim 8, wherein the energizing step comprises electrostatically biasing the ions toward the substrate.

10. (Previously Amended) A method as claimed in claim 8, wherein the energizing step comprises selectively accelerating the ions toward the substrate to provide the impact energy.

11. (As Filed) A method as claimed in claim 10, wherein the selectively energizing step comprises varying the potential of a cathodic arc source.

12. (Previously Amended) A method for producing magnetic recording media, the method comprising:

forming a magnetic layer over a substrate;

ionizing a source material so as to form a plasma containing ions which comprise carbon; and

energizing the ions to form a quasi-neutral stream from the plasma toward the substrate by applying an alternating potential between a coupling electrode and an extraction grid having a smaller surface area than the coupling electrode so that the plasma is self-biasing relative to the extraction grid, wherein the ions are energized so that carbon from the ions is deposited over the magnetic layer, and wherein the ions impact with an energy which promotes formation of sp3 carbon-carbon bonds.

13. (Previously Amended) A method for producing magnetic recording media, the method comprising:

forming a magnetic layer over a substrate;

ionizing a source material so as to form a plasma containing ions which comprise carbon, wherein the source material comprises a gas having a substantially coherent dissociation energy spectra; and

energizing the ions to form a stream from the plasma toward the substrate so that carbon from the ions is deposited over the magnetic layer, wherein the ions impact with an energy which promotes formation of sp3 carbon-carbon bonds.

14. (As Filed) A method as claimed in claim 13, wherein the source material comprises acetylene.

15. (As Filed) A method as claimed in claim 1, wherein the impact energy is between about 57 and 130 eV for each carbon atom.

16. (As Filed) A method as claimed in claim 15, wherein the impact energy is between about 100 and 120 eV for each carbon atom.

Claims 17-37 have previously been cancelled.

Please cancel claim 38.

~~38.~~ (Amended) A method as claimed in claim 1 [38], wherein the extraction electrode is disposed between the plasma and the deposition chamber, the stream passing axially through the extraction electrode.

40. (Previously Added) A method as claimed in claim 39, wherein the energizing step is performed using inductive coupling by applying an inductive alternating potential to an antenna disposed circumferentially around the plasma chamber.

41. (Previously Added) A method as claimed in claim 40, further comprising densifying the plasma by applying a magnetic field within the plasma chamber.

42. (Previously Added) A method as claimed in claim 41, further comprising homogenizing the plasma by moving the magnetic field within the plasma chamber.

43. (Previously Added) A method as claimed in claim 42, wherein the magnetic field is rotated about the axis within the plasma chamber by selectively energizing coils arranged radially about the plasma chamber.

44. (Previously Added) A method as claimed in claim 43, wherein the magnetic field rotates with a frequency which is much less than a frequency of the capacitative potential and much less than a frequency of the inductive potential.

45. (Previously Added) A method for producing magnetic recording media, the method comprising:

supporting a substrate in a deposition chamber;

inductively ionizing a source material in a plasma chamber with an antenna disposed circumferentially about the plasma chamber so as to maintain a plasma in the plasma chamber, the plasma containing ions which comprise carbon;

capacitively energizing the ions by applying an alternating potential between a coupling electrode adjacent one end of the plasma chamber and an extraction electrode adjacent another end of the plasma chamber so as to form a stream of ions through the extraction electrode, the stream passing